



## INTERNSHIP / MASTER THESIS

# Controlled Pump-Vent Process for Wafer Load Lock System

Are you looking for an opportunity to write your thesis in an industrial environment or obtain valuable industry experience, during or after your technical education? Here is one of many interesting topics we have on offer. We are also very open to your own ideas in order to create a matching opportunity for you at VAT.

Innovation has always been the driving force at VAT since the company was founded over 50 years ago. This has made us the world leader in vacuum valves and vacuum sealing technology. This pioneering spirit motivates us daily to meet our customers' requirements with enthusiasm. Together with our employees we stand for passion, innovation and quality. VAT is headquartered in Haag (Switzerland) and employs approximately 2 000 people worldwide. It has production centers in Haag (Switzerland), Penang (Malaysia) and Arad (Romania) as well as a production facility in Xinwu (Taiwan). With our customers mainly being situated in the United States and Asia, this provides a great opportunity to start an international career.

### *What you will explore:*

In the semiconductor industry, the ultra-clean manufacturing processes under vacuum conditions are required for the next technology nodes at 5nm and 3nm. Particles, which are bigger than critical dimensions of semiconductor devices (e.g. transistors) are detrimental for the circuitry (Microcontrollers, Memories) and result in defects and production losses. A load lock (LL) is the entry gate for all semiconductor processing equipment and transfers the production material. LL is held under atmospheric pressure when the material is exchanged and under vacuum conditions during the production process. A regulated transition procedure is desirable to prevent turbulences and particle generation in the LL that can deteriorate the quality of the product. The goal of the work is to develop a prototype for a controlled pump and vent system of the load lock.

Possible work packages are:

- Innovation process: creating ideas for a controlled LL transition from atmospheric to vacuum pressure and vice versa
- Development of a transition control algorithm (C, C++, Matlab & Simulink)
- Building a load lock prototype set-up for testing
- Verification of the transition control on the test set-up

### *What you will need:*

- Theoretical Background in mechanical, electrical engineering or similar,
- Practical know-how of innovation process and hands on attitude,
- Skills & Knowledge of control algorithms,
- Programming skills (e.g. C, C++, Matlab & Simulink)

### **Are You Ready for the Challenge?**

Then we look forward to receiving your **electronic application sent to Dominic Mayrhofer.**

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